PATENT SPECIFICATION

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DRAWINGS ATTACHED

1 210 060

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(72) Inventors GEORGY PROKOFIEVICH FUGA
GLEB LEONIDOVICH KRYLOV
VIKTOR GARRILOVICH PESOTSKY
VIKTOR MIKHAILOVICH TENISCHEV
GRIGORY VLADIMIROVICH BLJUMIN

(54) AUTOMATIC APPARATUS FOR MAKING GAUZES OF CORRUGATED WIRE

(71) We, AZOVSKOE SPETSIALNOE KONSTRUKTORSKOE BJURO KUZNECHNO-PRESSOVYKH AVTOMATOV I GIBOCHNYKH MASHIN, of Liteiny proezd 2, Rostovskoi oblasti, Azov, Union of Soviet Socialist Republics, a corporation organized and existing under the laws of the Union of Soviet Socialist Republics, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to automatic apparatus for making metal gauzes of corrugated wire.

Gauzes made with the help of such apparatus may be used for various purposes, e.g. as sieves in screening machines for separation of loose materials or as reinforcement in reinforced concretes.

Known in the art is automatic apparatus for making metal gauzes of cannelured wire, which comprises two harness frames mutually movable in a vertical direction the frames having healds with holes for passing longitudinally corrugated wires which form a warp shed of the gauze during the movement of the frames. In these machines a weft of corrugated wire in the form of a measuring length is fed into the warp shed with the help of a slay and laid into an open vertical groove provided in the plates of the reed of the slay.

For laying the measuring weft into the groove of the slay reed this apparatus has a disk-type feed mechanism which also served as a device for corrugating the wire weft, the axes of the disks of this mechanism being parallel to the plane of the gauze warp, and the weft being fed into the groove of the slay reed in a vertical plane. Such automatic machines were described for example, in the Soviet Author's Certificate No. 152834, Class 86 f; 2.

[*Price 5s. 0d. (25p)*]

Since the length of the weft is comparatively great (up to 2 meters with the minimum diameter of the wire being 1.6 mm), its stiffness is relatively low, and the feed of the weft into the groove of the slay reed is effected simultaneously with the corrugation of the weft, an intense vibration of the free end of the weft is observed in the direction of the open portion of the groove. As a result, the weft sometimes could not pass through the grooves of all plates of the reed and jumped off the groove, therefore, it could not be forced by the slay to the extreme position, to the place of weave of the warps, and automatic operation became impracticable. Therefore, when the known automatic apparatus was employed for making gauzes, wire of 5-6 mm in diameter was used, having a sufficient stiffness. Manufacture of gauzes from a wire having a smaller diameter was practically impossible.

According to the invention, there is provided automatic apparatus for making a metal gauze of corrugated wire, comprising two harness frames mutually movable in a vertical direction, the harness frames having healds with apertures for passing longitudinal wires which form a warp shed of the gauze during the movement of the frames, a slay having a reed with open apertures of a substantially circular cross section with a diameter corresponding to the transversal dimension of the corrugation of the weft of wire, the width of the open portion of the aperture being not less than the diameter of the weft wire which is laid into the aperture and moved by the slay into the shed of the warps, which are cyclically displaced as they are weaved with the wefts, and a disk-type mechanism for corrugating the weft and laying it into the aperture of the slay, this mechanism being so constructed that the axes of its disks are normal to the plane of the warp.

The apparatus is advantageous in that, due to the feed of the weft in a horizontal plane and due to the shape of the aperture, the weft is reliably transferred through all plates of the reed in succession since the vibrations of the free end of the weft are limited by the sidewalls of the aperture and the weft does not jump out of the aperture in the upward direction.

Another advantage consists in the free release of the weft from the reed aperture when the reed is forced by the slay to the extreme position.

The invention will be described further, by reference to the preferred embodiment thereof as illustrated in the accompanying drawings, in which:

Figure 1 is a gearing diagram of automatic apparatus for making metal gauze.

Figure 2 shows a partial view of the harness frames and slay of the automatic apparatus in a longitudinal section of the gauze.

Figure 3 shows a sectional view taken along the line III-III in Figure 2.

Figure 4 shows a view taken along the arrow A in Figure 1.

The automatic apparatus for making gauze of corrugated wire comprises a pair of harness frames 1 and 2 (Figure 1) mounted in parallel and capable of moving relative to each other in a vertical direction each carrying a plurality of vertically suspended replaceable healds 3 (Figure 2) in the form of parallel-secured plates. Mounted between the plates are rollers 4 defining apertures 5 for passing pre-corrugated longitudinal wires 6. During the movement at the frame 1 and 2 the apertures 5 of one frame are so displaced as to be staggered relative to the apertures 5 of the other frame, so that the longitudinal wires 6, when passed through these holes, form a warp shed Z as shown in Figure 2.

The free ends of the longitudinal wires 6 are secured in rolls 7 and 8 (Figure 1) freely rotating during the travel of the manufactured gauze, the roll 8 interacting with a pawl mechanism 9 which prevents this roll from rotating in the direction opposite to the direction of the gauze movement.

Mounted on an axle 10 located behind the harness frames 1 and 2 along the direction of the feed of the warps is a slay 11 which effects a vibratory motion in the direction transversal to the direction of travel of the frames, the slay 11 having a reed 12 consisting of vertically arranged plates 13 each having a projection 14 (Figure 2) and an aperture 15 open from above. It will be understood that the reed 12 and the healds 3 are made replaceable for making gauzes of different dimensions.

The apertures 15 in the projections 14 of the plates 13 form a groove 16 (Figure 3) along the length if the reed 12, into which groove a weft 17 of corrugated wire is placed and moved by the slay 11 within the shed Z, formed by the wires 6, to the place of intersection of these wires. The apertures 15 have a circular cross section with a diameter corresponding to and somewhat larger than, the transversal dimension l of the wire corrugation, whereas the width b of the open portion of the aperture 15 is not less than the diameter of the weft 17 to ensure unhampered withdrawal of the weft 17 from the groove 16 during the feed operation carried out by the slay 11.

Each aperture 15 has a conical widening 18 (Figure 3) at the side of feed of the weft 17 for free insertion of the weft 17 into the groove 16. The weft 17 is fed by means of rotary disks 19 whose axes 0 and 0' are normal to the plane of the warp of the gauze being made, i.e. the weft 17 is fed into the groove 16 in a horizontal plane. The disks 19 have radial plates 20 to corrugate the weft passing therebetween. The weft 17 is cut into measuring lengths by cutters 21 and 22 (Figure 1) arranged between the disks 19 and the facing portion of the slay 11.

As shown in Figure 1, the harness frames 1 and 2 are driven by a motor 23 through a reduction gear 24, two pairs of gear wheels 25 and 26 and cams 28 mounted on a shaft 27 and acting through rollers 29 upon rods 30 which are connected to the harness frames 1 and 2.

The slay 11 is powered from the same motor 23 through the gearbox 24, the pair of gear wheels 25, two pairs of gear wheels 31 and 32, and cams 34 mounted on a shaft 33, the cams interacting with rollers 35 secured to levers 36 whereby the slay 11 is fixed on the axle 10.

Mounted on the same axle and connected to the reciprocable cutter 22 is a lever 37 carrying a roller 38 interacting with a cam 39 mounted on the shaft 33, the cutter 21 being rigidly fixed.

The disks 19 for feeding the weft 17 are driven by the motor 23 through the gearbox 24, the pair of gear wheels 25, gear 31 and gear 40 which transmits motion to a faceplate 41 on which a slider 43 is mounted. The slider is actuated by a screw pair 42 and has a sliding block 44 positioned within a longitudinal slot of a swinging toothed sector 46 engaged with a gear 47 (Figures 1 and 4). The gear 47 is slidably mounted on a shaft 48 and engaged therewith through the use of an overruning clutch 49 which operates only during the swinging of the sector 46 in one direction corresponding to the feed of the weft 17 into the groove 16.

Thereafter, the torque from the shaft 48,

through a pair of bevel gears 50 and a pair of spur gears 51 engaged with gears 52, is transmitted to the disks 19 mounted on the same shaft 53 (Figure 1) as the gears 52.

The disks 19, depending on the dimensions of the cell of the gauze being made and on the diameter of the wire used in this operation, are made interchangeable and the distance between the axes 0 and 0' of the disks can be adjusted by running the gears 52 around the gears 51. It is obvious that the dimensions of the weft 17 by length can be adjusted by changing the magnitude of displacement of the axis of the sliding block 44 relative to the axis of rotation of the faceplate 41.

The apparatus operates in the following manner.

The harness frames 1 and 2 are set so that the apertures 5 in the healds 3 of both frames are on the same level. Then the corrugated wires 6 are passed through these apertures and the free ends of the wires are fixed in the rolls 7 and 8. During the mutual displacement of the frames 1 and 2 the wires 6 form a warp shed Z. While this is taking place, the disks 19 are rotated and the transversal corrugated wire is fed in a horizontal plane into the groove 16 of the reed 12 of the slay 11, passing the cutters 21 and 22 which cut from the wire a weft 17 in the form of a measuring length held within the groove 16. The slay 11 moves the weft 17 within the warp shed Z to the extreme position and keeps it there up to the moment of weaving the wire 6 of the warp (the weaving operation is carried out during subsequent displacement of the harness frames 1 and 2) and then returns it to the initial position in which it receives the next weft 17 transferred by the disks 19.

The manufactured gauze is fixed against displacements during the return of the slay 11 by the drawing rolls 7 and 8.

During industrial-scale application of the above automatic apparatus, stable feed of the weft 17 into the groove 16 of the reed 12 of the slay 11 has been obtained and no jumping of the weft 17 from the groove 16 has been observed.

WHAT WE CLAIM IS:—

1. Automatic apparatus for making a metal gauze of corrugated wire, comprising two harness frames mutually movable in a vertical direction, the harness frames having healds with apertures for passing longitudinal wires which form a warp shed of the gauze during the movement of the frames a slay having a reed with open apertures of a substantially circular cross section with a diameter corresponding to the transversal dimension of the corrugation of the weft of wire, the width of the open portion of the aperture being not less than the diameter of the weft wire which is laid into the aperture and moved by the slay into the shed of the warps which are cyclically displaced as they are weaved with the wefts, and a disk-type mechanism for corrugating the weft and laying it into the aperture of the slay, this mechanism being so constructed that the axes of its disks are normal to the plane of the warp.

2. Automatic apparatus for making a metal gauze of corrugated wire, substantially as described herein with reference to and as shown in the accompanying drawings.

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Chartered Patent Agents,
Agents for the Applicant(s).

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1,210,060
3 SHEETS

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

SHEET 1

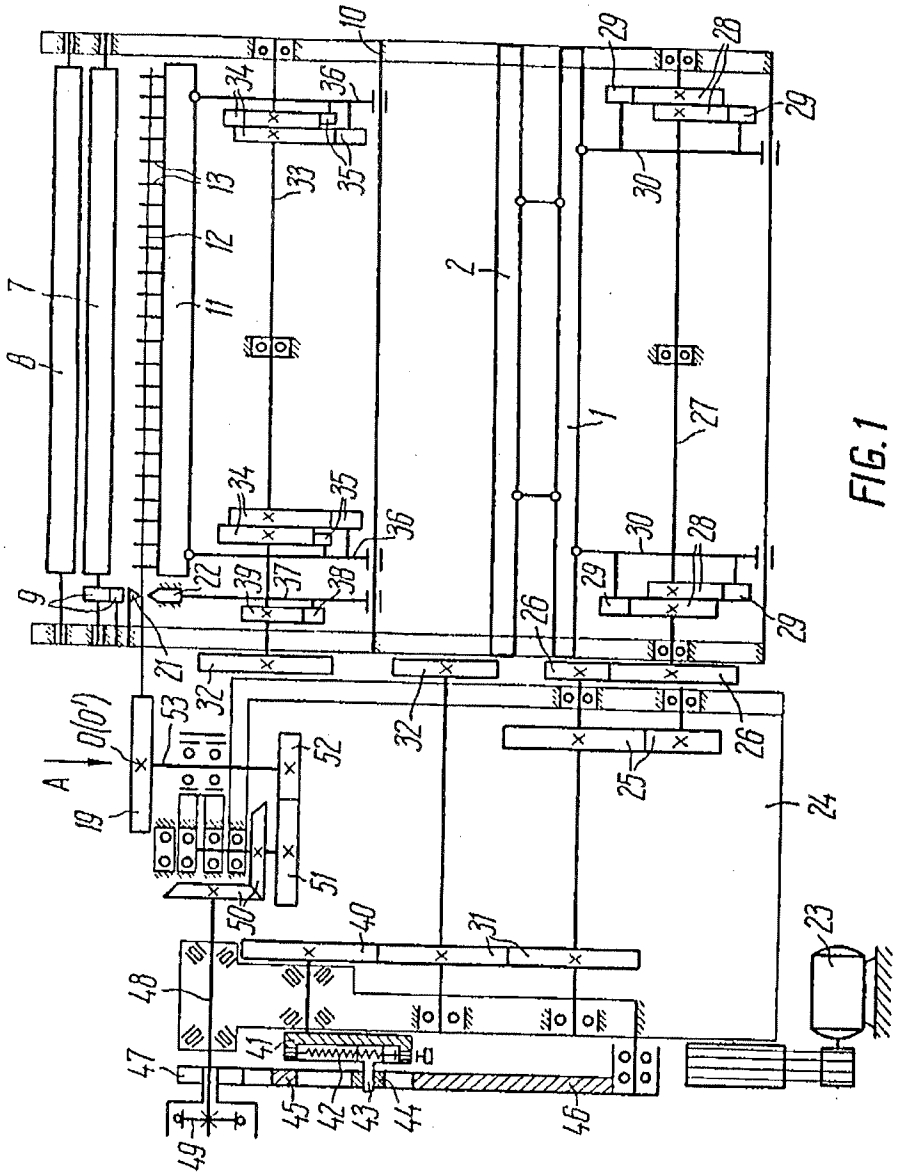

FIG. 1

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3 SHEETS

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

SHEET 2

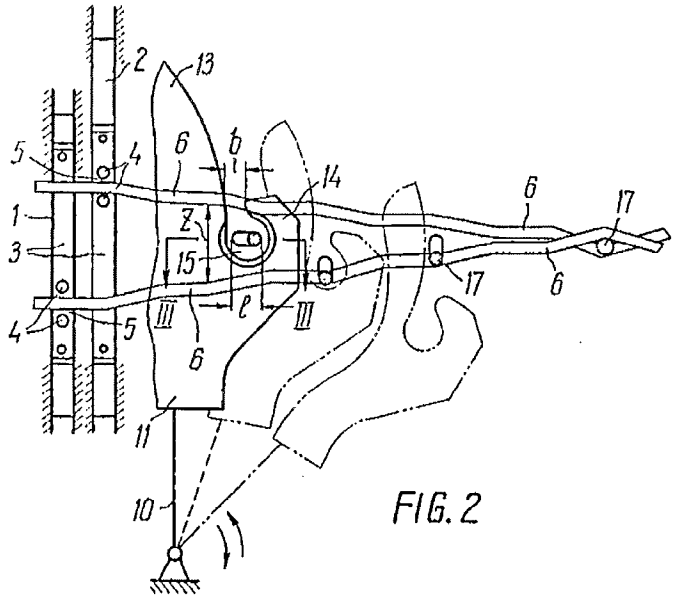

FIG. 2

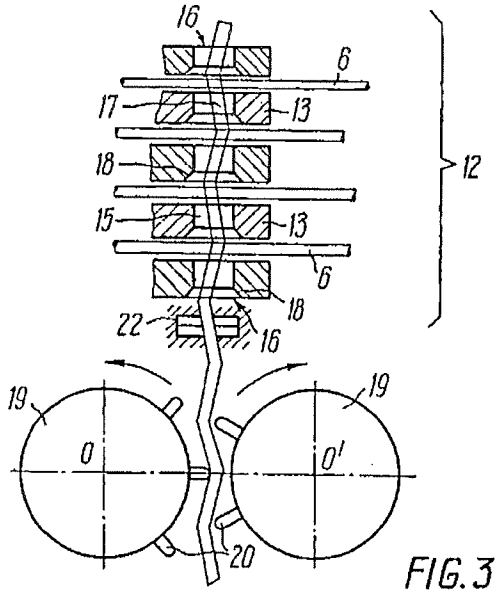

FIG. 3

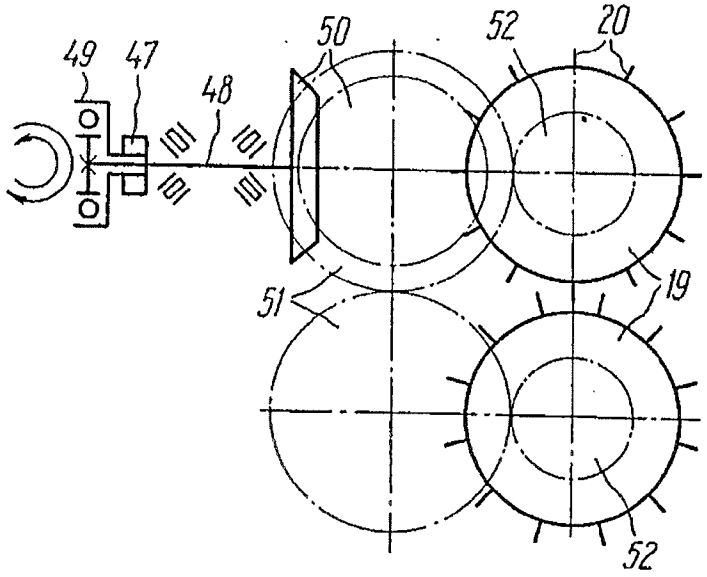

FIG. 4